Applying a sensitive method followed by a specific method does not improve signal detection for adverse events under vaccine surveillance.

METHODS
1. We evaluated six vaccine exposures: H1N1pdm, seasonal flu (Fluvirin), seasonal flu (Fluzone), seasonal flu (Aly), zoster (Shingrix), HPV (Gardasil 9) across four databases (CCAE, IBM MDCR, IBM MDCD, Optum EHR).
2. All data partners used the Observational Medical Outcomes Partnership (OMOP) common data model (CDM).
3. We generated a set of negative control and imputed positive control outcomes.
4. We defined a time-at-risk of 1-28 days after vaccination.
5. We used R programming to compute and compare the one-sided p values and type I and II errors (with and without empirical calibration) of a highly sensitive method (historical comparator), a highly specific method (self-controlled case series), and a method that sequentially combines the two.

RESULTS
• Using a highly sensitive method followed by a highly specific method did not compensate for the individual flaws of each method alone.

DISCUSSION
• The use of real-world data mapped to the CDM allows for replicability and transparency.
• One limitation was the lack of COVID-19 vaccine exposures.

CONCLUSION
• Our findings oppose clinical advice to use a serial method in signal detection.

AUTHORS
Faizah Arshad, Martijn J. Schuurman, Marc A. Suchard on behalf of the EUMAEUS task force

1. Department of Biostatistics, University of California, Los Angeles, Los Angeles, CA, U.S.A.
2. Department of Human Genetics, University of California, Los Angeles, Los Angeles, CA, U.S.A.
3. Observational Health Data Analytics, Janssen R&D, Titusville, NJ, U.S.A.